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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/646,988	08/22/2003	Darius D. Gaskins	CNTR.2209	1141

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HUFFMAN LAW GROUP, P.C.
1900 MESA AVE.
COLORADO SPRINGS, CO 80906

EXAMINER	
CONNOLLY, MARK A	

ART UNIT	PAPER NUMBER
2115	

NOTIFICATION DATE	DELIVERY MODE
04/10/2009	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

PTO@HUFFMANLAW.NET

Office Action Summary	Application No.	Applicant(s)	
	10/646,988	GASKINS ET AL.	
	Examiner	Art Unit	
	MARK CONNOLLY	2115	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 February 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *2/5/09*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1-22 have been presented for examination.

2. Applicant's arguments with respect to claim1-22 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 5 and 19 contain the trademark/trade name "MMX". Where a trademark or trade name is used in a claim as a limitation to identify or describe a particular material or product, the claim does not comply with the requirements of 35 U.S.C. 112, second paragraph. See *Ex parte Simpson*, 218 USPQ 1020 (Bd. App. 1982). The claim scope is uncertain since the trademark or trade name cannot be used properly to identify any particular material or product. A trademark or trade name is used to identify a source of goods, and not the goods themselves. Thus, a trademark or trade name does not identify or describe the goods associated with the trademark or trade name. In the present case, the trademark/trade name is used to identify/describe a functional unit and, accordingly, the identification/description is indefinite.

Claim Rejections - 35 USC § 103

5. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

6. Claims 1-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mittal[1] in view of Brock[2] in view of Browning[3] in view of Gschwind et al [Gschwind] US Pat No 6948082.

7. Referring to claim 1, Mittal teaches the apparatus within a microprocessor for managing power consumption of the microprocessor [col. 2 lines 14-19] substantially, including:

a. a plurality of functional units each including a corresponding plurality of activity outputs, for indicating when a respective functional unit is enabled [105 and 501 figs. 1 and 5 and col. 5 lines 40-43]. Mittal explicitly teaches that temperature, when used as an activity indicator, allows power consumption to be monitored.

b. utilization assessment logic, coupled to said plurality of activity outputs, for assessing activity thereof to determine a current total power consumption value for the microprocessor [col. 5 lines 30-43 and col. 11 lines 54-58].

c. power control logic, coupled to said utilization assessment logic, for comparing said current total power consumption value with a threshold power value included in a specified power profile, wherein a select signal directs said power control logic to select said specified power profile from a plurality of power profiles that are stored within said power control logic [col. 5 lines 30-43 and col. 11 lines 54-58]. Although a select signal is not explicitly taught, Mittal teaches engaging one of a plurality of power modes (i.e. power profile) in response to the utilization (i.e. power consumption) being greater or less than a threshold value. In order to trigger this response, it is obvious if not inherent that a signal would have to be generated in order to select the appropriate power mode. In

[1] As cited in the previous office action

addition, because the mode controller (107/502) initiates the change between a normal and reduced power mode without any explicit teaching of loading the power mode settings (i.e. power profile) from outside the mode controller, it is interpreted that the power profiles selected by the power control logic are selected from profiles stored within the power control logic.

d. a power consumption controller, coupled to said power management logic and said plurality of functional units, for engaging power reduction mode if said current total power consumption value exceeds said threshold power value [abstract and col. 5 lines 25-29]. Because the activity monitor and mode controller compare the power consumption value with a threshold value, selects a power mode in response to the comparison and engages that power mode, it is interpreted that the activity monitor and mode controller comprises the utilization assessment logic, power control logic and power consumption controller as they perform the same functions.

Although Mittal teaches using a measured temperature to represent the activity level for the purpose of monitoring power consumption, it is unclear as to whether or not the temperature is measured at each functional unit which would then be output as current activity information to their respective activity monitors, or if the temperature is measured at a central location to determine the "overall power." Because Mittal is concerned with independent control over each functional unit [fig. 5 and col. 11 lines 22-25 and 34-36], one would believe that the temperature would be measured at each functional unit in order to maintain individual control over "a particular functional unit 501" but suggesting that measuring a substrate temperature to

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[2] As cited by applicant in the IDS received 10/19/06.

determine "overall power" [col. 5 lines 40-41] seems to suggest otherwise. Brock teaches measuring temperature both globally and at individual processing elements for the purpose of controlling the processing elements individually or as a whole [col. 4 lines 4-14 and col. 7 lines 7-14]. It would have been obvious to one of ordinary skill in the art at the time of the invention to have each functional unit output its own temperature (i.e. current activity information) to their respective activity monitors, because it would allow the Mittal system to maintain independent control of the functional units while still limiting operation of each functional unit based on availability of power heat generation, etc… as taught by Brock [abstract].

Although Mittal implicitly teaches a select signal for selecting between power modes, it is not explicitly taught to have a select signal for selecting one of a plurality of power reduction modes to be engaged if the current total power consumption value exceeds said threshold power value. Browning teaches selecting a power mode from a plurality of power modes including a plurality of power reduction modes [figs. 6 and 7 and cols. 5-7 lines 64-8]. To summarize, Browning teaches having multiple temperature thresholds and initiating a power mode based on the current temperature. For example, when the temperature or power consumption of a processor is below threshold T1, the processor enters a first high power/performance state. When the processor temperature or power consumption is above threshold T1 but below threshold T2, the processor enters a second power/performance state that is lower than the first high power/performance state. Finally, if the temperature or power consumption of the processor is above threshold T2, the processor enters a power/performance state that is even lower than the second power/performance state.

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[3] As cited in the previous office action

It would have been obvious to one of ordinary skill in the art to include the plurality of reduced power states and to generate a selection signal to select one of the reduced power states to be engaged by power control logic and power consumption controller (i.e. activity monitor and mode controller), because it would obviously introduce varying degrees of performance throttling based on necessity, thus optimizing system performance. In particular, supplying just a single lower power mode does not optimize system operation. For example, if running a processor at a maximum rate and the temperature begins to overheat just slightly, an aggressive power reduced mode may not be necessary. By including a reduced power mode that is not as aggressive, power consumption and temperature can be reduced while still providing substantial performance. On the other hand if running the same processor at the same maximum rate and the processor begins to experience substantial overheating, the same aggressive power reduced mode would be necessary to rapidly reduce the temperature and power consumption at the expense of performance to prevent imminent damage to the processor circuitry. By providing varying degrees of performance, the system can maintain optimal performance given its current operating environment.

Although the Mittal-Brock-Browning system teaches the invention substantially as claimed above, it is not explicitly taught that the power is measured in Watts. Rather, Mittal, Brock and Browning are directed to determining power consumption indirectly through temperature measurement and controlling operation based on an activity level indicated by temperature. Gschwind teaches a similar operation controlling means that controls operation based on direct or indirect temperature or power measurements [col. 3 lines 37-55]. In other words, Gschwind teaches that one can use a temperature or power value to compare against a

threshold value for indicating that operation adjustment is necessary. In addition, Gschwind further teaches that the temperature and power values can either be directly or indirectly measured. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the Mittal-Brock-Browning system to measure the power representing activity directly (i.e. direct measurement of current and voltage in order to calculate power wherein Power = Voltage * Current) rather than indirectly (i.e. temperature measurement) because Gschwind teaches that either way will facilitate a means to control operation and a person with ordinary skill has good reason to pursue the known options within his or her technical grasp. It should also be noted that directly measuring power would result in a unit of measure in Watts because any other unit of measure for power besides Watts would represent an indirect measurement of power since power is directly measured in Watts.

8. Referring to claims 2-6, applicant(s) numerous definitions of a "functional unit" (claims 2-6) is construed to be an admission that the criticality does not reside in the type of "functional unit" utilized and hence obvious variations of one another. Mittal explicitly teaches a functional unit as being a functional unit as being a cache [col. 7 lines 43-50, col. 10 lines 52-59 and col. 11 lines 54-58]. Not accessing a cache is interpreted as disabling the usage of the cache. In addition, Mittal teaches that branch predictors and floating point units also consume substantial amounts of power just like cache memories [col. 2 lines 25-31 and col. 3 lines 5-8]. Furthermore, Mittal teaches reducing the rate of instructions [col. 3 lines 14-17]. It is interpreted that the instructions would be issued to an execute unit.

9. Referring to claims 7 and 8, Mittal teaches reducing a voltage and/or clock frequency [col. 5 lines 1-4].

10. Referring to claim 9, this is rejected on the same basis as set forth hereinabove. Furthermore, Mittal teaches assessing the activity of individual functional units [fig. 5 and col. 11 lines 38-39 and 54-58].

11. Referring to claim 10, Mittal teaches a control bus coupled between power management logic and power consumption controller [109 fig. 1A and 507, 508 fig. 5, col. 11 lines 54-58 and col. 12 lines 10-16]. In particular, Mittal additionally teaches that power coordinator can adjust the power modes between the functional units based on if utilization exceeds a threshold. Therefore the connection between the power coordinator and the activity monitors and power controllers are interpreted as control buses.

12. Referring to claims 11 and 12, Mittal teaches sending commands over a control bus to instruct power consumption controller to control the power consumption of either an individual functional unit or all functional units [fig. 5 and col. 5 lines 25-40 and col. 12 lines 28-41].

13. Referring to claim 13, this is rejected on the same basis as set forth hereinabove.

14. Referring to claim 14, this is rejected on the same basis as set forth hereinabove. Mittal teaches the apparatus and therefore teaches the method performed by the apparatus. In addition, Mittal further teaches prescribing a power profile to the device [col. 5 lines 43-61].

15. Referring to claims 15-22, these are rejected on the same basis as set forth hereinabove.

Conclusion

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to MARK CONNOLLY whose telephone number is (571)272-3666. The examiner can normally be reached on M-F 9AM-5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas C. Lee can be reached on (571) 272-3667. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Mark Connolly/
Primary Examiner, Art Unit 2115
4/7/09

Mark Connolly
Primary Examiner
Art Unit 2115